



ORIGINAL ARTICLE

Surgical wound infection in urology. Analysis of risk factors and associated microorganisms[☆]

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KEYWORDS

Urological surgery;
Risk factors;
Healthcare-associated infections;
Surgical wound infection;
Antibiotic resistance

Abstract

Objectives: Open surgery continues to have a fundamental role in urology, and one of its main complications is surgical wound infection. Our objective was to analyze surgical wound infection in patients who underwent surgery in our Department of Urology and to assess the risk factors, microorganisms and resistances by type of surgery.

Material and methods: This was a prospective observational study that included 940 patients: 370 abdominal/open lumbar surgeries and 570 genitoperineal surgeries. We analyzed age, sex, comorbidities, stay and type of surgery, as well as the causal microorganisms and antibiotic resistances.

Results: For genitoperineal surgery, we found 15 cases (2.6%) of surgical wound infection associated with previous urinary catheterisation. Most of the isolated microorganisms corresponded to enterobacteriaceae, highlighting the resistance to beta-lactam.

In abdominal/lumbar surgery, we found 41 cases (11.1%) of surgical wound infection. The incidence rate was 3.3% in prostate surgery; 9.8% in renal surgery; and 45.0% in cystectomy. Heart disease was associated with a higher incidence rate of surgical wound infection. The most common microorganisms were *Enterococcus* spp. (27.1%), *E. coli* (22.9%) and *Staphylococcus aureus* (14.6%). *Enterococcus* was resistant to ampicillin in 37.5%, and Extended-Spectrum Betalactamase-producing *E. coli* were isolated in 41.7%.

Conclusions: We found a low incidence rate of surgical wound infection in genitoperineal surgery, compared with renal surgery and cystectomy. The presence of heart disease and carrying a previous urinary catheter are factors associated with surgical wound infection. *Enterococcus* and *E. coli* are the most common pathogens, with high rates of resistance.

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PALABRAS CLAVE

Cirugía urológica;
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Infección de la herida
quirúrgica;
Resistencia a
antibióticos

Infección de herida quirúrgica en urología. Análisis de factores de riesgo y microorganismos asociados**Resumen**

Objetivos: La cirugía abierta sigue teniendo un papel fundamental en urología, y la infección de la herida quirúrgica es una de sus principales complicaciones. Nuestro objetivo fue analizar la infección de la herida quirúrgica en pacientes intervenidos por nuestro servicio de urología y valorar factores de riesgo, microorganismos y resistencias por tipo de cirugía.

Material y métodos: Estudio prospectivo y observacional. Incluyó 940 pacientes: 370 cirugías abdominal/lumbar abierta y 570 genitoperineales. Analizamos edad, sexo, comorbilidades, estancia y tipo de cirugía, así como microorganismos causantes y resistencias a antibióticos.

Resultados: En cirugía genitoperineal hallamos 15 casos (2,6%) de infección de la herida quirúrgica, asociándose a cateterismo urinario previo. La mayoría de los microorganismos aislados corresponden a enterobacterias, destacando las resistencias a betalactámicos.

En cirugía abdominal/lumbar encontramos 41 casos (11,1%) de infección de la herida quirúrgica. La incidencia fue del 3,3% en cirugía prostática, del 9,8% en cirugía renal y del 45,0% en cistectomía. Padece cardiopatía se asoció a mayor incidencia de infección de la herida quirúrgica. Los microorganismos más frecuentes fueron *Enterococcus* spp. (27,1%), *E. coli* (22,9%) y *Staphylococcus aureus* (14,6%). *Enterococcus* es resistente a ampicilina en el 37,5% y *E. coli* productor de betalactamasas, en el 41,7%.

Conclusiones: Encontramos escasa incidencia de infección de la herida quirúrgica en cirugía genitoperineal, comparada con la renal y cistectomía. La presencia de cardiopatía y portar catéter urinario previo son factores asociados a infección de la herida quirúrgica. *Enterococcus* y *E. coli* son los patógenos más frecuentes, con altas tasas de resistencia.

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Introduction

Healthcare associated infection (HAI) is defined as a localized or systemic condition resulting from the action of an infectious agent or its toxin.¹ It occurs when health care is being received and the infectious process is related to these, usually after 24 h from the hospital admission. They also represent a potentially severe complication, increasing hospital stay and economic costs.^{1,2} In studies conducted to assess the incidence of HAIs, they show rates of 6–14%.^{3,4}

The Centers for Disease Control and Prevention (CDC) define surgical wound infection (SWI) as that related to the incision of a surgical approach, being able to present purulent secretion or other signs of infection, even without microbiological confirmation.⁵ Proper surgical wound care is key, since in surgical services, it is one of the most frequent types of HAIs.⁶ The EPINE 2015 study places the SWI with a prevalence of 2.3%, being the most frequent type of HAIs, with 25.7% of the total.⁷ Patients with SWI are 60% more likely to enter intensive care, 5 times more likely to re-enter, and twice as likely to die.⁸

Before the suspicion of SWI, empiric antibiotic treatment is necessary before obtaining the results of the antibiogram. Therefore, it is essential to know the most frequent microorganisms, as well as their resistances.⁹

Our objective was to analyze the incidence, risk factors, and microorganisms with their resistances for SWI in patients admitted to our urology service.

Material and methods

We conducted a prospective observational study from January 1, 2012 to December 31, 2015. We included all patients admitted to Urology undergoing open surgery. We divided them into 2 groups: abdominal or lumbar surgery (prostate, renal and bladder surgery) and male and female genitoperineal surgery (scrotal, penile and female prolapses).

We excluded children under 16 (pediatric surgery), as well as kidney transplants and laparoscopic surgeries (although an incision is made for the extraction of the piece).

All our patients received antibiotic prophylaxis adjusted to the type of surgery according to the protocol of our service.¹⁰ For clean-contaminated open surgery involving the urinary tract, 2 g cefazolin is used in anesthetic induction. In patients with urinary catheter, ceftriaxone is used 12 h before surgery, with a new dose 24 h after the previous one. If the intervention requires manipulation of the intestine, gentamicin and vancomycin are used in anesthetic induction. Finally, in the case of implantation of prosthetic material, a specific antibiotic treatment is recommended with a duration of at least 3 days. We used amoxicillin-clavulanate in vaginal mesh placement, and vancomycin if a penile prosthesis or urinary sphincter is implanted.

The diagnosis of SWI was based on clinical manifestations (postoperative fever, local inflammatory signs, and spontaneous suppuration or wound opening). Samples were collected with swabs or puncture-aspiration for

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